Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An apparatus ~~(1) for providing a 3D~~ displaying an image in 3D~~display comprising a frame of rows of pixels~~, the apparatus comprising:

at least one display unit ~~(2)~~ for producing a beam of a 2D frame including at least one row of ~~display~~ an array of pixels ~~(19) each of which includes~~ including sub-pixels ~~(20)~~ corresponding to ~~display~~ elemental regions of the image in different view directions;~~,~~

an optical lens arrangement ~~(8)~~ configured to direct the beam ~~optical radiation~~ from the different elemental regions into respective divergent beams ~~(21a-21e)~~ corresponding to the view directions;~~,~~

a driver ~~(15)~~ connected to the display unit to drive the pixels of the display unit so as to refresh the 2D frame; ~~display elemental regions of rows of the image successively, and~~

an optical scanning system having a rotary mirror element ~~(9, 10, 12, 24, 25)~~ to receive the divergent beams ~~(21a-21e)~~ from the lens arrangement; and

a control unit connected to the driver for changing a tilt of the rotary mirror element between each 2D frame display, causing ~~for~~ the rows of the 2D frame to successively ~~and~~ display ~~them~~ as rows ~~(13)~~ of ~~the~~ a 3D image frame.

2. (Currently amended) The apparatus ~~(1)~~ according to claim 1, further comprising ~~including~~ a display screen ~~(14)~~, the scanning system ~~(9, 10, 12, 24, 25)~~ being operable to direct the beams corresponding to the successive rows ~~(13)~~ of the 3D image frame onto the screen.

3. (Currently amended) The apparatus ~~(1)~~ according to claim 2, wherein the display screen ~~(14)~~ comprises a diffuser for spreading the beams in a direction transverse to the row direction.

4. (Currently amended) The apparatus ~~(1)~~ according to claim 3, wherein the diffuser comprises lenticular lenses ~~(23)~~ positioned generally parallel to the row direction.

5. (Currently amended) The apparatus ~~(1)~~ according to claim 1, further comprising ~~means~~ a focus unit ~~(5,6)~~ for focusing the elemental regions of rows of images onto the optical lens arrangement ~~(8)~~.

6. (Currently amended) The apparatus ~~(1)~~ according to claim 5, wherein the focus unit ~~means (5,6) for focusing the elemental regions of rows of images onto the lens arrangement~~ comprises a plurality of converging lenses ~~(5,6)~~ with different focal lengths in the horizontal and vertical direction in order to match the dimensions of the elemental region of rows with the dimensions of the optical lens arrangement.

7. (Currently amended) The apparatus ~~(1)~~ according to claim 1, wherein the optical lens arrangement comprises ~~comprise~~ lenticular lenses ~~(8)~~.

8. (Currently amended) The apparatus ~~(1)~~ according to claim 1, wherein the ~~scanning device (9, 10, 12, 24, 25) comprises a~~ rotary mirror element ~~(10) to reflect~~ reflects the divergent beams ~~(21a-21e)~~.

9. (Currently amended) The apparatus ~~(1)~~ according to claim 8, wherein the rotary mirror element ~~(10)~~ is a rotating mirror or a rotating polygon with reflective surfaces.

10. (Currently amended) The apparatus ~~(1)~~ according to claim 8, wherein the scanning system ~~(9,10,12, 24, 25)~~ further comprises a concave mirror ~~(12)~~ to receive the divergent beams ~~(21)~~ from the rotary mirror element ~~(10)~~ and display them as rows ~~(13)~~ of the 3D image frame.

11. (Currently amended) The apparatus ~~(1)~~ according to claim 10, wherein the scanning system ~~(9, 10, 12, 24, 25)~~ comprises a lens ~~(9)~~ positioned in relation to the rotary mirror element ~~(10)~~ and the concave mirror ~~(12)~~ such that the rotary mirror element does not perturb the focusing of the 3D image in the direction transverse to the row direction.

12. (Currently amended) The apparatus ~~(1)~~ according to claim 10, wherein the scanning system ~~(9, 10, 12, 24, 25)~~ further comprises side mirrors ~~(24, 25)~~, ~~and wherein~~ the side

mirrors and the concave mirror ~~(12)~~ are configured to focus the divergent beams ~~(21a-21e)~~ containing information from one pixel ~~(19)~~ onto a small area ~~(28)~~ of the rows ~~(13)~~ of the 3D image frame.

13. (Currently amended) The apparatus ~~(1)~~ of claim 1, wherein the pixels ~~(19) contain enough~~ include one or more subpixels ~~(20)~~ to provide enough elemental regions such that each of more than one observer ~~(22a, 22b)~~ can observe the 3D image simultaneously and each of the more than one observer sees a slightly different view.

14. (Currently amended) The apparatus ~~(1)~~ of claim 1, wherein there are at least 50 elemental regions for each ~~3D~~ image.

15. (Currently amended) The apparatus ~~(1)~~ of claim 1, wherein for each elemental region there is another elemental region such that the images relating to the two elemental regions are shifted by less or equal to the parallax between the eyes.

16. (Currently amended) The apparatus ~~(1)~~ of claim 1, wherein a plurality of display units ~~(2)~~ are placed adjacent to each other in the direction parallel to the row direction and wherein the driver is configured to display different information on each display such that all the information corresponding to one row of the 3D image is displayed simultaneously across the plurality of the display units ~~(2)~~.

17. (Currently amended) The apparatus ~~(1)~~ of claim 1, wherein a plurality of display units ~~(2)~~ are placed adjacent to each other in the direction transverse to the row direction and wherein the driver is configured to display information on the plurality of displays relating to different rows of the 3D image frame and the scanning system comprises a plurality of rotary mirror elements for scanning the information onto said rows.

18. (Currently amended) ~~A domestic video and television display comprising the~~ The apparatus according to claim 1, further comprising at least one of a domestic video and television display.

19. (Currently amended) A method ~~for providing a 3D~~ of displaying an image in 3D ~~having a frame of rows of pixels~~, the method comprising acts of:

providing ~~successive displays (4) each~~ a beam of a 2D frame including at least one row of ~~display~~ an array of pixels, ~~(19) each of which includes~~ pixel including sub-pixels ~~(20)~~ corresponding to elemental regions of the image in different view directions~~,~~;

directing ~~optical radiation~~ the beam from the different elemental regions into respective divergent beams ~~(21)~~ corresponding to the view directions~~,~~; ~~and~~

successively refreshing the 2D frame, receiving the divergent beams at a scanning device having a rotary mirror element, tilting the rotary mirror element between each 2D frame display ~~(21) or the rows successively~~ and displaying them as rows ~~(13)~~ of the 3D image frame.

20. (Currently amended) The method of claim 19, further comprising an act of spreading the light containing the divergent beams in a direction transverse to the row direction in order to enlarge the viewing angle in the direction transverse to the row direction.

21. (Currently amended) The method of claim 19, further comprising acts of:

displaying the 3D image on a display screen ~~(14)~~, and

separating the beams ~~(21)~~ from different elemental regions before they are displayed on the display screen ~~(14)~~.

22. (Currently amended) The method of claim 19, comprising an act of creating a 3D pixel ~~(28)~~ on the display screen ~~(14)~~ by directing all the separate beams corresponding to different subpixels ~~(20)~~ of the same pixel ~~(19)~~ onto the same small area ~~(28)~~ of the display screen ~~(14)~~, such that the 3D pixel emits light corresponding to different views of the same point of an image source in different directions.

23. (Currently amended) The method of claim 19, ~~when used for~~ wherein the 3D image is displayed on at least one of a domestic television and video projection.